

MICROPLASTICS METHOD STANDARDIZATION

Leah Thornton Hampton, PhD

Southern California Coastal Water Research Project Authority



Microplastics in California

- **Microplastics are ubiquitous contaminants**
- California legislature has recognized the need to better understand microplastics
 - SB 1422: Drinking Water, SB 1263: Coastal Habitats
- Need to better understand **exposure** & **effects** to estimate **risk**
- SCCWRP and its partners are helping to create order by developing **monitoring tools** for microplastics



Methods in Disarray

- **Methods have not been standardized**
- Challenge for both sample **collection** and **analysis**
- Limited understanding of performance
 - Accuracy, precision, cost
- Different approaches can lead to results orders of magnitude different

Standardize methods for microplastics sample collection, processing, and analysis



Missing small particles, fibers



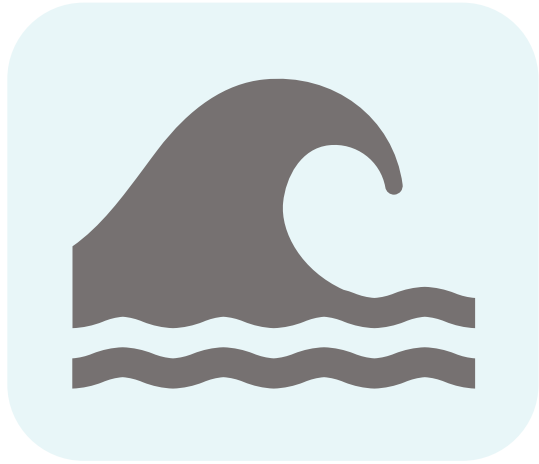
Grab Samples



Low volume sampled



Matrices for Method Standardization



Ambient Water



Drinking Water



Wastewater



Stormwater



Biota



Sediment



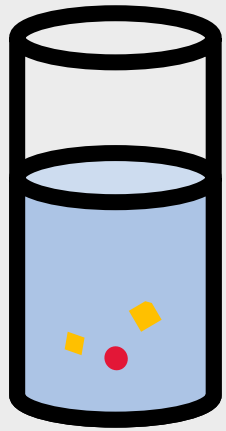
BMPs

Lab Analysis Method Standardization

- **Goal: Evaluate and standardize laboratory sample processing and analysis methods**
- International, **interlaboratory comparison study**
 - Over 20 laboratories, varying experience
 - Extract and analyzed microplastics from spiked samples using provided standard operating procedures
- Method performance evaluated by accuracy (microplastic recovery), precision (standard error), cost and time
- **Primary Outcome:**
 - Standard method and performance criteria

Lab Analysis Method Standardization

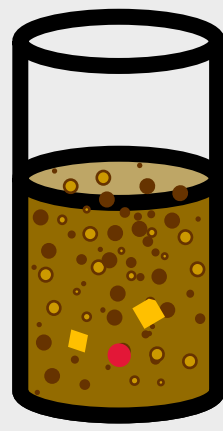
Interlaboratory Comparison Study



Drinking
Water



"Dirty"
Water



Sediment



Tissue

**Standardized processing and analysis methods
and laboratory accreditation program for
measuring microplastics**

Sample Processing and Analysis

Wastewater Method Development

- Ongoing assessment of microplastics in wastewater
- Developed new method for analyzing **microplastics in wastewater**



Collection Method Standardization

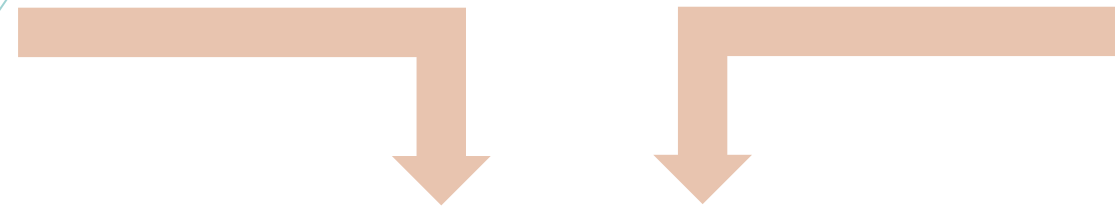
- **Goal: Evaluate and standardize sample collection methods for microplastics**
- Expert consensus that **stormwater** in waterways is the highest priority
 - Inherently complex
 - Major pathway
- Standardizing methods for ambient water, sediment, and biota as well
- **Anticipated Outcomes:**
 - SOPs
 - Advantages & disadvantages
 - Comparability between methods



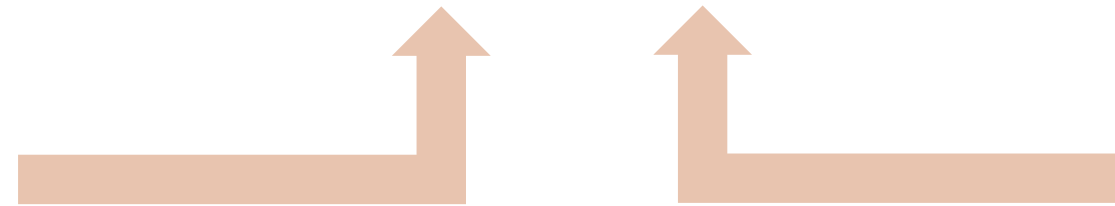
Method Progress

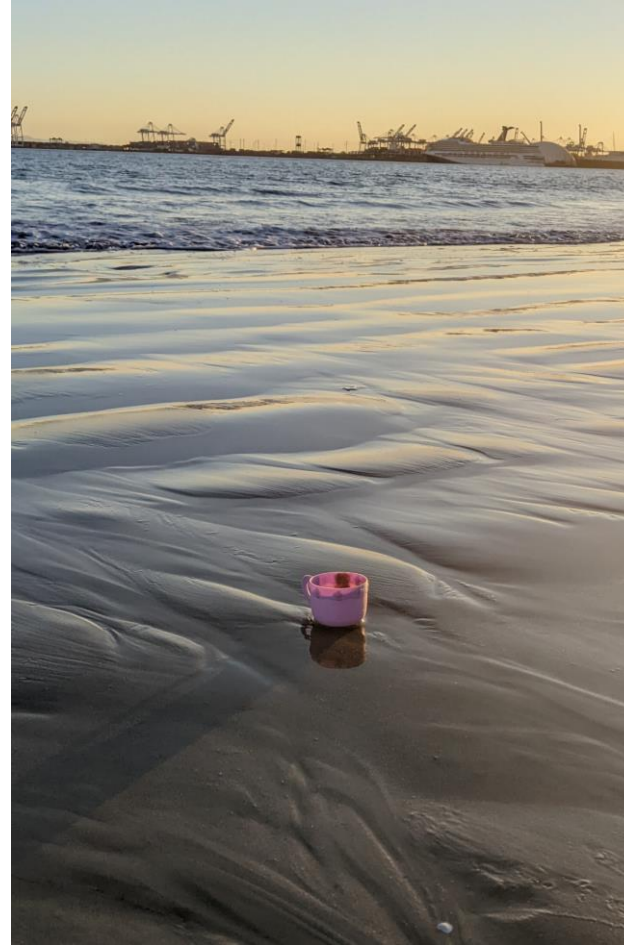
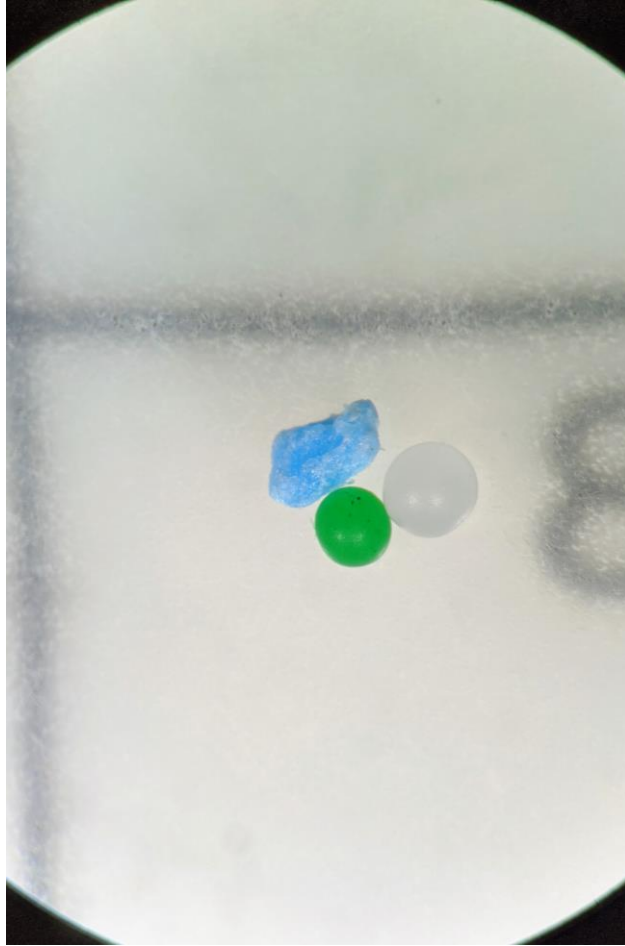
	Collection Methods		Analysis Methods		
Matrix	SOP	Adoption	SOP	Adoption	Accreditation
Drinking Water	Study Planned		Published	Adopted	Available
Wastewater	Published		Study complete		
Ambient Water	In Progress		Study complete; SOP prepared	End of Year	
Stormwater	Study Planned		Study complete; SOP prepared	Not Applicable	
Sediment	In Development		Study complete; SOP prepared	End of Year	
Biological Tissue	In Development		Study complete; SOP prepared	End of Year	
BMP	Not Started		Not Applicable		

Microplastics Monitoring Toolbox



**Risk
Characterization**





THANK YOU!

Leah Thornton Hampton, PhD

Southern California Coastal Water Research Project